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Preliminary Analysis of Energy Recovery Potential for Lancaster County, South Carolina

CSI Resource Systems Inc.
Boston, MA

Prepared for

Environmental Protection Agency
Atlanta, GA

Oct 81

U.S. Department of Commerce
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This study was made to determine the economic feasibility of converting solid waste resources into low pressure process steam to meet energy requirements of local industry. Economic projections for both a 50 TPD and a 72 TPD systems were developed and financing methods are discussed.

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Preliminary Analysis of Energy Recovery Potential for Lancaster County, South Carolina

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Technical assistance by personnel teams. 42 USC 6913

RESOURCE RECOVERY AND CONSERVATION PANELS

SEC. 2003. The Administrator shall provide teams of personnel, including Federal, State, and local employees or contractors (hereinafter referred to as "Resource Conservation and Recovery Panels") to provide States and local governments upon request with technical assistance on solid waste management, resource recovery, and resource conservation. Such teams shall include technical, marketing, financial, and institutional specialists, and the services of such teams shall be provided without charge to States or local governments.

This report has been reviewed by the Project Officer, EPA, and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Environmental Protection Agency, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

Project Officer: Elmer G. Cleveland

PRELIMINARY ANALYSIS
OF
ENERGY RECOVERY POTENTIAL
FOR
LANCASTER COUNTY, SOUTH CAROLINA

Prepared for

OFFICE OF SOLID WASTE MANAGEMENT

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION IV, ATLANTA, GEORGIA

By

CSI RESOURCE SYSTEMS, INC.

September 1981

PREFACE

This report was prepared for Lancaster County, South Carolina, under the Technical Assistance and Panels Program, which is conducted by the U.S. Environmental Protection Agency (EPA) to provide assistance to state and local governments. Technical assistance was provided in response to requests submitted to U.S. EPA Region IV by Lancaster County.

This report presents the results of a preliminary determination of the feasibility of resource recovery for the Lancaster County area. This determination involved the evaluation of the market potential for energy recovery; development and comparative evaluation of various resource recovery alternatives; and identification of major tasks to be performed prior to deciding to implement a resource recovery project.

These activities reflect the results of two site visits to Lancaster County by CSI Resource Systems, Inc., and interviews with County personnel and three industrial energy users in the area.

Resource Systems is a technical assistance contractor to the Office of Solid and Hazardous Waste, U.S. EPA Region IV. Under the terms of the Technical Assistance and Panels Program, all of Resource Systems' technical assistance activities on behalf of Lancaster County were paid for by EPA.

Resource Systems wishes to thank especially the following individuals for their support and generous cooperation: Henry Beckham, Jr., Director of Engineering and Floyd Williams, Vice President-Engineering Services, both of Springs Mills; and Richard Kesler, Lancaster County Planning Director and Lindsay Pettis, Lancaster County Commissioner.

PRELIMINARY EVALUATION OF RESOURCE RECOVERY ALTERNATIVES FOR LANCASTER COUNTY, SOUTH CAROLINA

Analysis has been performed to determine the economic feasibility of converting solid waste resources generated by Lancaster County, South Carolina, into low-pressure process steam to meet energy requirements for one of three local industries. (See Appendix B for project background.) Preliminary indications are that the combined wastes from Lancaster City and County can support the materials requirements for a 50-TPD (tons per day) resource recovery facility to be operated 6 days per week.

Estimates of capital costs, annual costs, and revenues were developed for a 6-year period from 1984 (assumed to be the first year of commercial operations) through 1989 for three systems: a 50-TPD facility operating 6 days per week (50-TPD_6), a 72-TPD system operating 5 days per week (72-TPD_5), and a 72-TPD system operating on a 6-day schedule (72-TPD_6). (The larger systems were included in the analysis because of the possibility that surrounding communities could supply additional solid waste if resource recovery proves to be cost-competitive with their present method of landfilling.)

The methodology for developing system economics and capital cost/staff requirements is presented in Appendix A. The Initial Trip Report, June 25, 1981, in Appendix B summarizes Lancaster County's current solid waste management practices and interest in developing a resource recovery project.

FINDINGS

The feasibility of resource recovery depends upon securing a long-term compatible market for recovered energy. Springs

Mills is the only viable energy market for process steam in Lancaster County. Based on 1980-1981 historic weekly average steam consumption, Springs Mills can use 90-95 percent of the steam produced by a Lancaster solid waste resource recovery facility after the company implements its own 10,000-lb-per-hr in-plant recovery project.

Two other industrial companies -- Rexham and Mallory -- were identified as potential customers by Lancaster County's Planning Director. However, the modest steam energy requirements and variable demand of both companies eliminated them as economically feasible markets.

The economic projections of the 50-TPD and 72-TPD systems were developed under various operational assumptions and three financing methods: Industrial Revenue Bond (IRB), General Obligation Bond (GOB), and a combination of 25-percent Equity and IRB. The first-order economics for the 50-TPD resource recovery facility range from $13.68 to $22.25/ton in 1984 to $7.01 to $15.58/ton in 1989, depending upon financing method employed. For both 72-TPD systems, 1984 projections range from $10.74 to $26.63/ton and 1989 projections range from $2.89 to $19.30/ton as a function of both capacity utilization (annual throughput) and financing method. These projections are summarized in the following Table.

FIRST- AND SIXTH-YEAR PROJECTED ECONOMICS
FOR THREE RESOURCE RECOVERY OPTIONS

Rated Capacity (tons per day)	Days Operated Per Week	Financing Method	Projected Economics 1984	1989
50	6	IRB	22.25	15.58
50	6	GOB	18.82	11.35
50	6	25% Equity/IRB	13.68	7.01
72	5	IRB	26.63	19.30
72	5	GOB	21.48	14.15
72	5	25% Equity/IRB	16.32	8.99
72	6	IRB	19.34	11.49
72	6	GOB	18.14	11.90
72	6	25% Equity/IRB	10.74	2.89

Assuming that the price charged the County for landfill disposal service represents the actual cost incurred by the City in operating the existing landfill and that this cost is likely to increase at a 10 percent annual rate, the projected cost of continued landfilling is approximately $8.00 and $12.86 per ton in 1984 and 1989.

The summary of projected economics and supportive documents (see Appendix A) indicate the following conclusions:

- Small-scale resource recovery appears to have potential as a cost-competitive solid waste disposal option for the Lancaster County area.
- To achieve the projected economics, both Lancaster City and Lancaster County waste must be available to support the waste material requirements of a resource recovery facility.
- Sufficient solid waste from surrounding areas outside Lancaster to support the material requirements of a 72-TPD_6 resource recovery facility will maximize the economic attractiveness of resource recovery.
- The economic feasibility of resource recovery requires a high system utilization factor (i.e., the system operates 6 days per week and processes waste equivalent to at least 90 percent of its nominal design capacity), and the purchase of at least 90-95 percent of the energy produced from its combustion by Springs Mills.
- The economics of resource recovery are influenced by the financing method; the combination of partial equity provided by the system vendor/developer and IRB financing results in the lowest debt service component and hence lowest net disposal costs for all three evaluated options.

ASSUMPTIONS

The following assumptions were used in developing the

first-order economics for each resource recovery option:

- Resource recovery facility becomes operational in 1984.
- Costs, including capital and operating, escalate at 10 percent per year compounded.
- Financing terms are: 17 years at 11 percent for IRB and Equity/IRB options; 17 years at 10 percent interest for GOB options.
- Energy revenues are predicated upon fuel displaced value of 150 psi steam (at assumed boiler efficiency of 85 percent and 10 percent condensate return at 100°F), less 10 percent discount to energy customer. Fuel oil prices increase by 10 percent/yr, hence steam revenues increase by 10 percent annually.
- For the 50 TPD_6 facility, 95 percent of the steam produced is sold; for the 72-TPD_5 and 72-TPD_6 facilities, 90 percent of steam produced is sold.
- Under equity/IRB financing, 25 percent of system capital cost is invested as equity by system developer/vendor in return for the benefits of ownership (i.e., investment credit and accelerated depreciation).

NEXT STEPS

The analysis in Appendix A supports the conclusion that a small-scale resource recovery facility can be a cost-effective disposal alternative for the Lancaster area. However, before deciding to implement this project, Lancaster County officials must fully evaluate the project's technical and economic feasibility by completing the following steps:

Step 1. Assess technical feasibility by verifying that adequate volumes of MSW are available. An economically viable resource recovery project requires an ample and continuous

supply of solid waste materials. Because the analysis indicates that the solid waste generated solely by Lancaster County is unlikely to support an economically viable resource recovery project, the County should obtain a commitment from Lancaster City to participate on a joint basis. In addition, the quantity of solid waste likely to be available should be determined by conducting a solid waste weighing program. Finally, acquiring additional solid waste from surrounding communities may improve the economics of resource recovery. If joint participation with other communities seems desirable, their potential contribution of waste should be determined by implementing a weighing program.

Step 2. Confirm the existence of a technically compatible energy market. Successful resource recovery depends on the existence of an interested and technically compatible energy market. As a result, Springs Mills personnel should be contacted to verify its continued interest in the concept of purchasing process steam. To determine technical compatibility, the County should analyze Springs Mills's projected net hourly steam requirements. To the extent that future hourly steam demand falls, or that average weekly figures do not reflect substantial hourly variability, the economic viability of resource recovery will be overstated.

Step 3. Conduct professional assessment of the project's long-term economic feasibility. The County should hire an engineering or consulting firm to verify the concept's continued economic viability after it determines whether the project is technically feasible in Steps 1 and 2.

APPENDIX A

The tables in this Appendix reflect calculations and analyses used to develop the economic projections in the report.

Tables 1 and 2 present the total financing requirements for 50- and 72-TPD modular combustion systems under three financing alternatives: Industrial Revenue Bond (IRB); General Obligation Bond (GOB); and a combination of 25 percent Equity and IRB. In addition to equipment capital costs, the options also entail costs for engineering and legal assistance; capitalized interest to meet bond payments during the construction and startup periods, but before revenues are generated; start-up expenses; a debt service reserve fund (most resource recovery projects financed under IRB require a minimum of one year of reserved capitalized debt service payments to protect bondholders); and bond underwriting costs.

Table 3-11 present the cost elements associated with the operation of the nine different systems evaluated. As this analysis indicates, factors affecting the net disposal cost (i.e., per-ton cost of disposal) are:

- Solid waste throughput
- Quanity of energy sold
- Financing method.

Tables 12 and 13 project staffing requirements for 50-TPD_6 and 72-TPD_6 modular combustion resource recovery facilities. The larger system offers labor-associated economies of scale; i.e., only two additional personnel are required to staff a facility capable of processing nearly 45 percent more waste.

Table 1

FINANCING REQUIREMENTS
FOR 50 TPD MODULAR COMBUSTION SYSTEM
($000's)

	IRB	GOB	25% Equity/IRB
A. Capital Cost	2,333	2,333	2,333
B. Engineering/Legal	250	250	250
LESS: Equity Contribution	--	--	<646>
SUBTOTAL	2,583	2,583	1,937
C. Capitalized Interest	550	400	356
D. Allowance for Startup	125	125	125
E. Debt Service Reserve	515	--	382
F. Bond Financing	117	34	87
TOTAL BOND ISSUE	3,890	3,139	2,887
TOTAL FINANCING	3,890	3,139	3,533

Table 2

FINANCING REQUIREMENTS
FOR 72 TPD MODULAR COMBUSTION SYSTEM
($000's)

	IRB	GOB	25% Equity/IRB
A. Capital Cost	3,359	3,359	3,359
B. Engineering/Legal	250	250	250
LESS: Equity Contribution	--	--	<902>
SUBTOTAL	3,609	3,609	2,707
C. Capitalized Interest	793	500	480
D. Allowance for Startup	150	150	150
E. Debt Service Reserve	720	--	528
F. Bond Financing	163	43	120
TOTAL BOND ISSUE	5,435	4,301	3.986
TOTAL FINANCING	5,435	4,301	4,887

Table 3

PROJECTED ECONOMICS FOR 50 TPD_6
MODULAR COMBUSTION SYSTEM --
IRB FINANCING

ANNUAL SOLID WASTE THROUGHPUT (tons)	13,500
ANNUAL ENERGY SALES (pounds of steam)	57,713,000

EXPENSE ITEM ($/ton)	OPERATING YEAR	
	1 (1984)	6 (1989)
Debt Service	38.15	38.15
O&M	20.00	32.20
Residual Disposal	3.00	4.83
Operator's Fee	5.00	8.05
SUBTOTAL	66.15	83.23
REVENUES ($/ton)		
Steam	38.94	62.69
Debt Service Reserve Earnings	4.96	4.96
SUBTOTAL	43.90	67.65
REQUIRED TIP FEE ($/ton)	22.25	15.58

Table 4

PROJECTED ECONOMICS FOR 50 TPD_6 MODULAR COMBUSTION SYSTEM -- GOB FINANCING

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ANNUAL SOLID WASTE THROUGHPUT (tons)	13,500
ANNUAL ENERGY SALES (pounds of steam)	57,713,000

EXPENSE ITEM ($/ton)	OPERATING YEAR	
	1 (1984)	6 (1989)
Debt Service	28.96	28.96
O&M	20.00	32.20
Residual Disposal	3.00	4.83
Operator's Fee	5.00	8.05
SUBTOTAL	56.96	74.04
REVENUES ($/ton)		
Steam	38.94	62.69
Debt Service Reserve Earnings	--	--
SUBTOTAL	38.94	62.69
REQUIRED TIP FEE ($/ton)	18.02	11.35

Table 5

PROJECTED ECONOMICS FOR 50 TPD$_6$
MODULAR COMBUSTION SYSTEM--
25% EQUITY/IRB FINANCING

ANNUAL SOLID WASTE THROUGHPUT (tons)	13,500
ANNUAL ENERGY SALES (pounds of steam)	57,713,000

EXPENSE ITEM ($/ton)	OPERATING YEAR	
	1 (1984)	6 (1989)
Debt Service	28.30	28.30
O&M	20.00	32.20
Residual Disposal	3.00	4.83
Operator's Fee	5.00	8.05
SUBTOTAL	56.30	73.38
REVENUES ($/ton)		
Steam	38.94	62.69
Debt Service Reserve Earnings	3.68	3.68
SUBTOTAL	42.62	66.37
REQUIRED TIP FEE ($/ton)	13.68	7.01

Table 6

PROJECTED ECONOMICS FOR 72 TPD_5
MODULAR COMBUSTION SYSTEM --
IRB FINANCING

ANNUAL SOLID WASTE THROUGHPUT (tons)	16,200
ANNUAL ENERGY SALES (pounds of steam)	65,610,000

EXPENSE ITEM ($/ton)	OPERATING YEAR	
	1 (1984)	6 (1989)
Debt Service	44.44	44.44
O&M	16.86	27.15
Residual Disposal	3.00	4.83
Operator's Fee	5.00	5.05
SUBTOTAL	69.30	84.47
REVENUES ($/ton)		
Steam	36.89	59.39
Debt Service Reserve Earnings	5.78	5.78
SUBTOTAL	42.67	65.17
REQUIRED TIP FEE ($/ton)	26.63	19.30

Table 7

PROJECTED ECONOMICS FOR 72 TPD_5
MODULAR COMBUSTION SYSTEM --
GOB FINANCING

ANNUAL SOLID WASTE THROUGHPUT (tons)	16,200
ANNUAL ENERGY SALES (pounds of steam)	65,610,000

EXPENSE ITEM ($/ton)	OPERATING YEAR	
	1 (1984)	6 (1989)
Debt Service	33.51	33.51
O&M	16.86	27.15
Residual Disposal	3.00	4.83
Operator's Fee	5.00	8.05
SUBTOTAL	58.37	73.54
REVENUES ($/ton)		
Steam	36.89	59.39
Debt Service Reserve Earnings	--	--
SUBTOTAL	36.89	59.39
REQUIRED TIP FEE ($/ton)	21.48	14.15

Table 8

PROJECTED ECONOMICS FOR 72 TPD_5
MODULAR COMBUSTION SYSTEM --
25% EQUITY/IRB FINANCING

ANNUAL SOLID WASTE THROUGHPUT (tons)	16,200
ANNUAL ENERGY SALES (pounds of steam)	65,610,000

EXPENSE ITEM ($/ton)	OPERATING YEAR	
	1 (1984)	6 (1989)
Debt Service	32.59	32.59
O&M	16.86	27.15
Residual Disposal	3.00	4.83
Operator's Fee	5.00	8.05
SUBTOTAL	57.45	72.62
REVENUES ($/ton)		
Steam	36.89	59.39
Debt Service Reserve Earnings	4.24	4.24
SUBTOTAL	41.13	63.63
REQUIRED TIP FEE ($/ton)	16.32	8.99

Table 9

PROJECTED ECONOMICS FOR 72 TPD_6
MODULAR COMBUSTION SYSTEM --
IRB FINANCING

ANNUAL SOLID WASTE THROUGHPUT (tons)	19,440
ANNUAL ENERGY SALES (pounds of steam)	78,732,000

EXPENSE ITEM ($/ton)	OPERATING YEAR	
	1 (1984)	6 (1989)
Debt Service	37.04	37.04
O&M	16.00	25.77
Residual Disposal	3.00	4.83
Operator's Fee	5.00	8.05
SUBTOTAL	61.04	75.69
REVENUES ($/ton)		
Steam	36.89	59.39
Debt Service Reserve Earnings	4.81	4.81
SUBTOTAL	41.70	64.20
REQUIRED TIP FEE ($/ton)	19.34	11.49

Table 10

PROJECTED ECONOMICS FOR 72 TPD_6
MODULAR COMBUSTION SYSTEM --
GOB FINANCING

ANNUAL SOLID WASTE THROUGHPUT (tons)	19,440
ANNUAL ENERGY SALES (pounds of steam)	78,732,000

EXPENSE ITEM ($/ton)	OPERATING YEAR	
	1 (1984)	6 (1989)
Debt Service	31.03	31.03
O&M	16.00	25.77
Residual Disposal	3.00	6.44
Operator's Fee	5.00	8.05
SUBTOTAL	55.03	71.29
REVENUES ($/ton)		
Steam	36.89	59.39
Debt Service Reserve Earnings	--	--
SUBTOTAL	36.89	59.39
REQUIRED TIP FEE ($/ton)	18.14	11.90

Table 11

PROJECTED ECONOMICS FOR 72 TPD$_6$
MODULAR COMBUSTION SYSTEM --
25% EQUITY/IRB FINANCING

ANNUAL SOLID WASTE THROUGHPUT (tons)	19,440
ANNUAL ENERGY SALES (pounds of steam)	78,732,000

EXPENSE ITEM ($/ton)	OPERATING YEAR	
	1 (1984)	6 (1989)
Debt Service	27.16	27.16
O&M	16.00	25.77
Residual Disposal	3.00	4.83
Operator's Fee	5.00	8.05
SUBTOTAL	51.16	65.81
REVENUES ($/ton)		
Steam	36.89	59.39
Debt Service Reserve Earnings	3.53	3.53
SUBTOTAL	40.42	62.92
REQUIRED TIP FEE ($/ton)	10.74	2.89

Table 12

PERSONNEL REQUIREMENTS
FOR
50 TPD_6 MODULAR COMBUSTION SYSTEM

Position	No. of Employees	Employee Salary	Total
Plant Manager	1	$25,000	$ 25,000
Shift Manager	3	19,000	57,000
Scale Operator	1	14,000	14,000
Operators	5	14,000	70,000
Maintenance Mechanic	1	17,500	17,500
Total	11		$183,500
Fringe Benefits @ 33%			60,600
TOTAL LABOR EXPENSE			$244,100
Projected Labor Expense in 1984, the Assumed First Year of Operation[1]			$324,700

[1] Increased at 10% per year to 1984.

Table 13

PERSONNEL REQUIREMENTS
FOR 72- AND 100-TPD$_6$ MODULAR COMBUSTION SYSTEMS

Position	No. of Employees	Employee Salary	Total
Plant Manager	1	$25,000	$ 25,000
Shift Manager	3	19,000	57,000
Scale Operator	1	14,000	14,000
Operators	7	14,000	98,000
Maintenance Mechanic	1	17,500	17,500
Total	13		$211,500
Fringe Benefit @ 33%			69,800
TOTAL LABOR EXPENSE			$281,300
Projected Labor Expense in 1984, the Assumed First Year of Operation[1]			$374,100

[1] Increased at 10% per year to 1984.

APPENDIX B

The Initial Trip Report of June 25, 1981, which summarizes Lancaster County's current solid waste management practices and interest in developing a resource recovery project, is presented in this Appendix.

BACKGROUND

In May 1981 Francis L. Bell, Jr., Chairman of the Lancaster County Council, requested technical assistance from EPA, Region IV, to evaluate the feasibility of a County-sponsored resource recovery project. In response to that request (letter attached), David Ouellet, of CSI, and Elmer Cleveland, EPA Project Officer, traveled to meet with County officials.

A meeting was held on Thursday, June 6, at the County Office Building in Lancaster to determine the merits of the County's request and to gather additional information. Attending the meeting were the Messrs. Ouellet and Cleveland; Allan Raymond, South Carolina State Bureau of Solid and Hazardous Wastes; Carroll Huffman, County Administrator; Johnny Baker, County Public Works, Phonzo Starnis, County Controller; Richard Kesler, County Planning Director; and Mary Barry and Lindsay Pettis, County Commissioners.

The following day Messrs. Cleveland, Kesler, Ouellet, Pettis and Raymond traveled to Fort Mills, South Carolina, the corporate headquarters of Springs Mills, Inc., a potential energy market for resource recovery steam, to meet with its corporate engineering staff. Representing Springs Mills at this meeting were Henry Beckham, Jr., Director of Engineering, and Floyd Williams, Vice President-Engineering Services.

OBSERVATIONS

The following observations are based on a review of background information submitted in support of this request and information developed during the initial site visit.

Characteristics of Lancaster County

Lancaster County is located approximately 40 miles south of Charlotte, North Carolina. County officials estimate that 1980 population was 53,000, although this figure is now somewhat higher due to continued rapid growth. The county is primarily rural, with at present a modest industrial base.

Solid Waste Practices

Lancaster County operates a greenbox collection system which serves the residential and commercial sector. At present, there are 18 greenbox sites, at which approximately 250 6-cubic-yard containers are located. Four of these sites are designated for oversized bulky items, such as refrigerators and sofas. Refuse deposited at these sites is collected weekly by the County Department of Public Works and delivered to a landfill owned and operated by the city of Lancaster. Current disposal fees to the county are $1.25 per cubic yard, although the charge is expected to increase on July 1, 1981. Collection and disposal costs are paid for by the county out of its general fund.

In 1980, Lancaster County disposed of approximately 48,000 cubic yards compacted municipal solid waste (MSW). It is estimated that the city of Lancaster generated 29,000 cubic yards during this same period. A limited weighing program carried out indicated that the density of the waste collected by the county is approximately 400 pounds/cu yd. Based on this limited weighing program, annual countywide solid-waste

generation from residential and commerical sectors (but excluding industrial waste or waste collected by private waste contractors) is approximately 15,400 tons, or 62 TPD_5.

The city-owned landfill has an estimated remaining life of 10-15 years.

Interest in Resource Recovery

The county's interest in resource recovery stems from several factors. First, Springs Mills, its largest industry, signed an agreement with the county for $1 million in industrial development bonds to finance a waste boiler facility to utilize in-plant wastes to meet a portion of its steam energy requirements. Second, the county is dependent upon the city to provide disposal capacity. And finally, the cost of this disposal service has been increasing rapidly.

Potential Energy Customer

As previously stated, Springs Mills is in the process of installing a waste heat boiler at its Lancaster complex manufacturing facility. This facility is one of two located in Lancaster County. The second, the Grace complex, is its largest plant in terms of energy consumption, and consequently has a coal-fired power plant. Springs Mills is a major textile concern (1980 annual sales of $795 million) producing finished fabrics and home furnishings. The Lancaster complex presently utilizes natural gas as a boiler fuel in the production of low-pressure process steam for applications such as dyeing and fabric setting.

The company has budgeted $1 million to purchase and install a waste heat boiler capable of producing approximately 10,000 lbs per hour of steam from assorted waste materials generated from several of its manufacturing concerns. The waste materials comprised of such items as fabric trimmings, lint, broken pallets, corrugated, and cafeteria-type wastes

will be baled and transported by rail to the Lancaster complex. On the basis of Spring Mills's recent steam consumption profile, the waste heat boiler will be able to meet over 50 percent of the company's minimum hourly steam requirement of 17,000 pounds and approximately 25 percent of its peak needs. The waste heat boiler is projected to displace the annual energy equivalent of 400,000 gallons of fuel oil.

When the county learned of Spring's Mills's interest in implementing its own in-plant energy recovery project, it approached the company with the concept of expanding the scope of the project to include municipal solid waste from the county and possibly the city as well. Although such a concept held the potential of substantially increasing the energy available from alternative fuels, the company did not wish to jeopardize the progress of its own project. (At that time, Springs Mills had finally received corporate funding of the waste heat boiler, having first submitted its request in 1975; and was in the final negotiation stages with the prospective boiler manufacturer -- the Brule Company of Chicago.)

After a June 7 meeting with county representatives, the company, through its engineering director, agreed to provide a contiguous site and work with the county in integrating an MSW energy generating facility with its own waste-heat boiler some time in the future, provided, of course, that the initial project proves to be a technical and economic success.

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RECOMMENDED ACTION

The county has expressed its desire to end its dependence on increasing costly landfill disposal service provided by the city, while Springs Mills has demonstrated its commitment to financing and implementing an in-plant energy recovery facility. Further, the company is willing to consider expanding that facility in the near future to accommodate MSW.

Given these circumstances, CSI recommends that a Phase II feasibility study be performed to determine whether the concept of integrating a small-scale (50-75 TPD_5) MSW energy recovery system with an existing waste-heat boiler complex is likely to be technically and economically viable.

LANCASTER COUNTY
1785
LANCASTER, SOUTH CAROLINA 29720

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May 11, 1981

Mr. Elmer G. Cleveland, Project Officer
U. S. Environmental Protection Agency
Residuals Management Branch - Technical Assistance
345 Courtland Street N.E.
Atlanta, Georgia 30365

Dear Mr. Cleveland:

I am writing in regard to the Environmental Protection Agency's Technical Assistance Program in the areas of solid waste and the recovery of resources from solid waste. We in Lancaster County would like very much to participate in that program. The cost of depositing our solid waste in a sanitary landfill is increasing at a rapid rate and we would like to explore economical and environmentally sound alternatives for handling refuse.

At present, solid waste in Lancaster County is managed through a system of "green box" sites. There are 18 such sites located throughout the County containing a total of approximately 250 six-cubic-yard steel boxes. Residents and merchants in the County may deposit their household and commercial garbage in these boxes at no charge. Four of the 18 "green box" sites are designated for dumping of large items, such as refrigerators and sofas. The refuse deposited at all 18 sites is collected regularly by the County Public Works Department and disposed of in a sanitary landfill owned and operated by the City of Lancaster. The City presently charges the County $1.25 per cubic yard of refuse deposited in the landfill and it is expected that the rate will increase significantly beginning July 1, 1981. In 1980, Lancaster County disposed of 48,000 compacted cubic yards of solid waste in the city-owned landfill. The city of Lancaster deposited approximately 29,000 compacted cubic yards of refuse in the same facility in that year.

Despite the fact that Lancaster County does not generate a large amount of solid waste in comparison to some other areas, we believe there is a potential market for the energy that could be recovered from the County's refuse. Recently, Lancaster County signed an agreement to issue $1,000,000 in industrial revenue bonds for Springs Mills, Inc., a textile manufacturing firm. Springs plans to use those funds to construct a plant that will convert their industrial waste into steam for use at their manufacturing

facility south of the City of Lancaster. In talking with Springs officials, the County has learned that the proposed plant will generate only about 50% of the Company's minimum steam demand. Company officials have indicated they would be receptive to the idea of purchasing steam from the County if the County were to construct and operate a steam generation facility. In addition, officials from the City of Lancaster have suggested that the City might be interested in cooperating with the County in the area of resource recovery.

Although Lancaster County is not particularly large in terms of population (53,361 according to the 1980 Census), the County is growing rapidly and that growth virtually ensures that our solid waste situation will become more expensive and troublesome. Understandably, we are excited about the possibility of utilizing alternative methods of dealing with solid waste and we firmly believe that EPA's expertise in this area can assist us in determining how we can best handle our refuse in a cost-effective manner. As such, we hope we can participate in your agency's Technical Assistance Program and examine in more detail some of the options available to us.

We look forward to hearing from you at your earliest convenience and thank you for your consideration. If we can provide any further information, do not hesitate to contact us.

Sincerely yours,

Francis L. Bell, Jr.
Chairman
Lancaster County Council

ilp

Highly-advanced incinerator chosen for Lancaster Complex

The incinerator scheduled for installation at the Lancaster Complex is one of the most advanced made today.

"This incinerator is designed so that bales of waste can be fed into it automatically by a hydraulic system," says purchasing manager Norman Robinson.

Other advanced features include automatic ash removal and pollution control equipment that meets government clean air regulations. This pollution control equipment will allow the incinerator to burn wastes without putting smoke into the air.

Fired by natural gas

While the incinerator will be fired by waste materials, it will also include natural gas burners. These burners will be programmed to fire should the burning waste materials fall below a certain temperature.

"Also helping to keep the waste materials at a high temperature will be waste oil we also plan to burn," Robinson said.

"These waste oils include such things as used crankcase oil from vehicles. We currently have to pay to have these oils disposed of. With the incinerator we'll be able to get some value from them by helping generate heat and steam."

Joint effort

Springs' Purchasing Department has been working with the Engineering Complex incinerator project.

While engineering is responsible for the technical design of the system, purchasing has the responsibilities for negotiating the purchase and delivery of the incinerator, obtaining construction bids on the building to house the incinerator and gathering information on wastes available for burning.

Delivery in October

The incinerator chosen for the project is manufactured by Brulé Incinerators of Illinois and is scheduled for delivery in October. Actual operation is expected to begin early in 1982.

"We contacted our plants and pulled together information on the kinds and amounts of waste they have," Robinson said. "That information was then furnished to engineering who figured the type and size of incinerator needed."

Purchasing was called in to do the study on the availability of waste materials since that department is responsible for selling all of Springs' wastes that have some economic value, such as rags, thread waste and cardboard boxes.

"In our study of plants' waste we found a number of waste materials suitable for burning," Robinson said. "These materials include sweepings, lint trapped in dust collectors, oily rags and paper, cardboard and wood scraps.

"There are all waste items that cost the company money for disposal. With the incinerator in operation, we'll be putting these wastes to work helping the company save money."

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The Springs Bulletin

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Project will turn trash into cash

Each working day dozens of trucks leave Springs' textile plants loaded with cotton and polyester lint and scrap wood, cardboard and paper.

These trucks are headed for local landfills where they deliver about 12 million pounds of waste for disposal each year.

The cargo in these trucks has no economic value. It's strictly waste. But the cost to Springs for transportation and disposal is large.

Situation changing

This situation will soon change, however, because of a project scheduled at the Lancaster Complex. This project will put these waste materials to work helping Springs save money.

The idea behind the project is simple:

Why not burn plant wastes in an incinerator and use the heat that's created to fire a boiler. The heat and resulting steam could be used at the huge Lancaster Complex, resulting in a big savings in fuel oil.

Oil prices rising

"We started looking at this project back in 1973 before the oil embargo," says Henry Beckham, director of engineering for Springs.

"Fuel oil prices in the early 1970s were so low, however, we just couldn't save enough money to justify the investment in an incinerator and boiler," he said.

But everyone knows what's happened to fuel oil prices since the embargo. With prices for number 6 fuel oil (the cheapest grade) expected to hit $1 a gallon this winter, the waste burning project began to make financial sense for Springs.

Also adding to the attractiveness of

Saving 400,000 gallons

"The incinerator and boiler we plan to build will save the company more than 400,000 gallons of fuel oil each year," says Beckham. "It will also reduce our expenses for landfill disposal."

The project calls for construction of an incinerator and boiler behind the Lancaster Complex. Waste products from the grey mills and from the Grace complex will be brought to the incinerator for burning.

Because the boiler heated by the incinerator will not be able to supply all of the Lancaster Complex's need for steam in slashing and heat, two existing fuel oil boilers will continue to operate, but at reduced levels.

Breaking ground

"We expect to break ground on the project early this fall and have it in operation before the end of the winter," Beckham said.

The incinerator and boiler will be housed in a 7,800 square foot building to be built behind the Lancaster Complex between 10th and 11th streets.

The $1 million project is being financed through industrial revenue bonds issued by Lancaster County. This type bond offers a lower interest rate than other types of borrowing because the bonds are issued by a unit of local government.

But, even though Lancaster County will issue the bonds, Springs Mills, not the taxpayers, will be responsible for paying the bonds off.

A growing trend

Lynn Tollison, manager of Springs' incinerator project, says a growing number of companies are using waste materials to produce heat and steam.

"More and more companies are finding it necessary to add to their production of steam and at the same time reduce their fuel costs," Tollison said.

"There's definitely a trend toward boilers heated by waste materials. It just makes good economic sense to add an incinerator if a company has the kinds of good, burnable wastes that Springs has and, at the same time, a need for the steam that can be produced."

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now going to landfills will be burned to create heat and steam in a new incinerator project Springs has planned.

'The incinerator and boiler we plan to build will save the company more than 400,000 gallons of fuel each year.'